

What is claimed is:

1. A method for providing management information associated with a storage area network, the method comprising steps of:

5 displaying a physical network topology associated with the storage area network on a display screen, the physical network topology including identification of at least one switch resource that supports connectivity among host resources and storage resources in the storage area network;

10 receiving a signal indicating a selected at least one managed resource associated with the storage area network; and

displaying a virtual network topology associated with the selected at least one managed resource in relation to the physical network topology.

2. A method as in claim 1, wherein displaying the virtual network topology includes:

15 overlaying the virtual network topology associated with the selected at least one managed resource on the displayed physical network topology, the method further comprising:

20 displaying port identification information in relation to corresponding ports in the at least one switch resource to identify which ports of the at least one switch resource are associated with the virtual network topology.

3. A method as in claim 2, wherein the steps of receiving, displaying and overlaying are executed by a resource manager application of the storage area network, the resource manager application enabling a network manager to select and view at least one virtual storage area network as a portion of the physical network topology; and

25 wherein displaying port identification information includes highlighting which ports of the at least one switch source belong to the virtual network topology.

4. A method as in claim 1, wherein receiving a signal indicating a selected at least one managed resource associated with the storage area network includes receiving a selection associated with a first storage area network and a second storage area network; and

5 wherein displaying the virtual network topology includes:

simultaneously displaying, on the display screen, representations of i) the first virtual storage area network associated with a first selected managed resource, and ii) the second virtual storage area network associated with a second selected managed resource;

10 the first virtual storage area network and the second storage area network  
being uniquely illustrated as portions of the physical network topology displayed  
on the display screen.

5. A method as in claim 4 further comprising:

15 highlighting portions of the physical network topology with a first color to identify network resources associated with the first storage area network; and

highlighting portions of the physical network topology with a second color to identify network resources associated with the second storage area network.

20 6. A method as in claim 1, wherein displaying the virtual network topology includes:

displaying a virtual storage area network associated with the at least one selected managed resource on the display screen; and

highlighting portions of the physical network topology to identify at least partial paths between host resources and storage resources associated with the virtual storage area network.

25 virtual storage area network.

7. A method as in claim 1 further comprising:

in a first region of the display screen, displaying multiple icons representing corresponding managed resources associated with the storage area network; and

in relation to the multiple icons, maintaining corresponding display regions to receive input commands from a user making a corresponding selection of the at least one managed resource.

- 5 8. A method as in claim 7, wherein displaying the multiple icons includes displaying a hierarchy of multiple icons, the method further comprising:

enabling a user to expand a view of the hierarchy of multiple icons to facilitate a selection of the at least one managed resource associated with the storage area network.

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9. A method as in claim 1 further comprising:

in a first region of the display screen, displaying a vertically disposed hierarchy of multiple icons representing corresponding managed resources associated with the storage area network;

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enabling a user to make a selection of at least one of the multiple icons to select the at least one managed resource associated with the storage area network; and

in a second region of the display screen, displaying the physical network topology and the virtual network topology.

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10. A method as in claim 9, wherein displaying the vertically disposed hierarchy of multiple icons includes displaying the hierarchy of icons on the left side of the display screen; and

wherein displaying the virtual network topology associated with the selected at least one managed resource includes displaying the virtual network topology on a right side of the display screen, the method further comprising:

in relation to the hierarchy of multiple icons on the left side of the display screen, maintaining corresponding selectable display regions to receive input commands from a user making a corresponding selection of the at least one managed resource.

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11. A method as in claim 1, wherein receiving the signal indicating the selected at least one managed resource includes receiving a first signal identifying a virtual storage area network associated with the storage area network; and  
5 wherein displaying the virtual network topology includes displaying specific ports and corresponding identifications of the specific ports of the at least one switch resource associated with the virtual storage area network.
12. A method as in claim 11 further comprising:  
10 receiving a second signal identifying a selected zone associated with the virtual storage area network; and in response to receiving the second signal, displaying at least one host resource and at least one storage resource associated with the selected zone in relation to the virtual storage area network on the display screen.  
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13. A method as in claim 12 further comprising:  
20 on the display screen, highlighting connection paths between the at least one host resource and the at least one switch resource as well as between the at least one switch resource and the at least one storage resource to identify network resources associated with the selected zone.
14. A method as in claim 13, wherein displaying the at least one host resource and the at least one storage resource associated with the selected zone includes:  
25 displaying an identification of host resource ports associated with the at least one host resource that physically couple to corresponding switch resource ports of the at least one switch resource; and displaying an identification of storage resource ports of the at least one storage resource that physically couple to corresponding switch resource ports of the at least one switch resource.

15. A method as in claim 14 further comprising:

displaying multiple icons representing corresponding selectable managed resources associated with the storage area network, at least one of the selectable managed resources representing a virtual network topology that may be selected for viewing in a second region of the display screen; and

displaying the virtual storage area network topology based on a selection of at least one of the multiple icons, the virtual storage area network i) being overlayed on the physical network topology, and ii) including identified ports of the at least one switch resource that are associated with a corresponding virtual storage area network.

10 16. A method for displaying management information associated with a storage area network on a display screen, the method comprising:

in a first region of the display screen:

15 displaying multiple icons representing corresponding selectable managed entities associated with the storage area network, at least one of the selectable managed entities representing a virtual network topology that may be selected for viewing in a second region of the display screen; in the second region of the display screen:

20 displaying a physical network topology associated with the storage area network, the physical network topology including at least one switch resource that supports connectivity among host resources and storage resources in the storage area network; and

25 displaying the virtual storage area network topology based on a selection of at least one of the multiple icons, the virtual storage area network i) being overlayed on the physical network topology, and ii) including identified ports of the at least one switch resource that are associated with a corresponding virtual storage area network.

17. A method as in claim 16, wherein displaying the virtual network topology includes:

5 simultaneously displaying i) a first virtual storage area network associated with a first selected managed entity, and ii) a second virtual storage area network associated with a second selected managed entity; and

the first virtual storage area network and the second storage area network being illustrated as portions of the physical network topology displayed on the display screen.

- 10 18. A method as in claim 17, wherein displaying the virtual network topology includes:

highlighting portions of the physical network topology to identify at least partial paths between host resources and storage resources associated with the first virtual storage area network and the second storage area network.

- 15 19. A method as in claim 16 further comprising:

displaying the first region on the left side of the display screen, the first region including a vertically disposed hierarchy of multiple icons representing corresponding selectable and expandable managed entities associated with the storage area network;

20 displaying the virtual network topology and physical network topology on a left side of the display screen, the virtual network topology including specific ports and corresponding identification information of the specific ports of the at least one switch resource associated with the virtual storage area network topology; and

25 highlighting the specific ports of the at least one switch resource to indicate that the specific ports are part of the virtual storage area network topology.

- 30 20. A method as in claim 16 further comprising:

displaying at least one host resource and at least one storage resource associated with the virtual storage area network topology on the display screen.

21. A method as in claim 20 further comprising:

5                   in the second region of the display screen, highlighting connection paths between the at least one host resource and the at least one switch resource as well as between the at least one switch resource and the at least one storage resource;

10                  displaying an identification of host resource ports associated with the at least one host resource that physically couple to corresponding switch resource ports of the at least one switch resource; and

                        displaying an identification of storage resource ports of the at least one storage resource that physically couple to corresponding switch resource ports of the at least one switch resource.

15 22. A method for providing management information associated with a storage area network, the method comprising steps of:

20                  displaying a physical network topology associated with the storage area network on a display screen, the physical network topology including identification of at least one switch resource that supports connectivity among resources in the storage area network;

                        receiving input from a user to display at least one virtual network associated with the storage area network; and

                        displaying a virtual network topology associated with the at least one virtual network in relation to the physical network topology on the display screen.

25 23. A method as in claim 22, wherein displaying the virtual network topology includes displaying specific ports and corresponding identifications of the specific ports of the at least one switch resource associated with the at least one virtual network.

24. A method as in claim 23 further comprising:  
displaying at least one host resource and at least one storage resource associated with the at least one virtual network on the display screen.
- 5 25. A method as in claim 24 further comprising:  
on the display screen, highlighting connection paths between the at least one host resource and the at least one switch resource as well as between the at least one switch resource and the at least one storage resource.
- 10 26. A method as in claim 25, wherein displaying the at least one host resource and the at least one storage resource includes:  
displaying unique identification information of host resource ports associated with the at least one host resource that physically couple to corresponding switch resource ports of the at least one switch resource; and  
15 displaying unique identification information of storage resource ports of the at least one storage resource that physically couple to corresponding switch resource ports of the at least one switch resource.
27. A computer system for displaying management information associated with a storage area network, the computer system comprising:  
20 a processor;  
a memory unit that stores instructions associated with an application executed by the processor; and  
an interconnect coupling the processor and the memory unit, enabling the computer system to execute the application and perform operations of:  
25 displaying a physical network topology associated with the storage area network on a display screen, the physical network topology including identification of at least one switch resource that supports connectivity among host resources and storage resources in the storage area network;

receiving a signal indicating a selected at least one managed resource associated with the storage area network; and  
displaying a virtual network topology associated with the selected at least one managed resource in relation to the physical network topology.

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28. A computer system as in claim 27, wherein displaying the virtual network topology includes:

overlays the virtual network topology associated with the selected at least one managed resource on the displayed physical network topology, the method further comprising:

displaying port identification information in relation to corresponding ports in the at least one switch resource to identify which ports of the at least one switch resource are associated with the virtual network topology.

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29. A computer system as in claim 28, wherein displaying port identification information includes highlighting which ports of the at least one switch source belong to the virtual network topology.

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30. A computer system as in claim 27, wherein receiving a signal indicating a selected at least one managed resource associated with the storage area network includes receiving a selection associated with a first storage area network and a second storage area network; and

wherein displaying the virtual network topology includes:

simultaneously displaying, on the display screen, representations of i) the first virtual storage area network associated with a first selected managed resource, and ii) the second virtual storage area network associated with a second selected managed resource;

the first virtual storage area network and the second storage area network being uniquely illustrated as portions of the physical network topology displayed on the display screen.

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31. A computer system as in claim 30 further supporting operations of:

highlighting portions of the physical network topology with a first color to identify network resources associated with the first storage area network; and

5 highlighting portions of the physical network topology with a second color to identify network resources associated with the second storage area network.

32. A computer system as in claim 27, wherein displaying the virtual network topology includes:

10 displaying a virtual storage area network associated with the at least one selected managed resource on the display screen; and

highlighting portions of the physical network topology to identify at least partial paths between host resources and storage resources associated with the virtual storage area network.

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33. A computer system as in claim 27 further supporting operations of:

in a first region of the display screen, displaying multiple icons representing corresponding managed resources associated with the storage area network; and

20 in relation to the multiple icons, maintaining corresponding display regions to receive input commands from a user making a corresponding selection of the at least one managed resource.

25 34. A computer system as in claim 33, wherein displaying the multiple icons includes displaying a hierarchy of multiple icons, the computer system further supporting operations of:

enabling a user to expand a view of the hierarchy of multiple icons to facilitate a selection of the at least one managed resource associated with the storage area network.

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35. A computer system as in claim 27 further supporting operations of:  
in a first region of the display screen, displaying a vertically disposed hierarchy of multiple icons representing corresponding managed resources associated with the storage area network;  
5 enabling a user to make a selection of at least one of the multiple icons to select the at least one managed resource associated with the storage area network;  
and  
in a second region of the display screen, displaying the physical network topology and the virtual network topology.
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36. A computer system as in claim 35, wherein displaying the vertically disposed hierarchy of multiple icons includes displaying the hierarchy of icons on the left side of the display screen; and  
wherein displaying the virtual network topology associated with the selected at least one managed resource includes displaying the virtual network topology on a right side of the display screen, the computer system further supporting operations of:  
15 in relation to the hierarchy of multiple icons on the left side of the display screen, maintaining corresponding selectable display regions to receive input commands from a user making a corresponding selection of the at least one managed resource.  
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37. A computer system as in claim 27, wherein receiving the signal indicating the selected at least one managed resource includes receiving a first signal identifying a virtual storage area network associated with the storage area network; and  
wherein displaying the virtual network topology includes displaying specific ports and corresponding identifications of the specific ports of the at least one switch resource associated with the virtual storage area network.
- 30 38. A computer system as in claim 37 further supporting operations of:

receiving a second signal identifying a selected zone associated with the virtual storage area network; and

5 in response to receiving the second signal, displaying at least one host resource and at least one storage resource associated with the selected zone in relation to the virtual storage area network on the display screen.

39. A computer system as in claim 38 further supporting operations of:

10 on the display screen, highlighting connection paths between the at least one host resource and the at least one switch resource as well as between the at least one switch resource and the at least one storage resource to identify network resources associated with the selected zone.

40. A computer system as in claim 39, wherein displaying the at least one host resource and the at least one storage resource associated with the selected zone includes:

15 displaying an identification of host resource ports associated with the at least one host resource that physically couple to corresponding switch resource ports of the at least one switch resource; and

20 displaying an identification of storage resource ports of the at least one storage resource that physically couple to corresponding switch resource ports of the at least one switch resource.

41. A computer system as in claim 40 further supporting operations of:

25 displaying multiple icons representing corresponding selectable managed resources associated with the storage area network, at least one of the selectable managed resources representing a virtual network topology that may be selected for viewing in a second region of the display screen; and

30 displaying the virtual storage area network topology based on a selection of at least one of the multiple icons, the virtual storage area network i) being overlayed on the physical network topology, and ii) including identified ports of

the at least one switch resource that are associated with a corresponding virtual storage area network.

42. A computer system for displaying management information associated with a storage area network, the computer system comprising:
- 5 a processor;
  - a memory unit that stores instructions associated with an application executed by the processor; and
  - an interconnect coupling the processor and the memory unit, enabling the computer system to execute the application and perform operations of:
  - 10       in a first region of the display screen:
    - displaying multiple icons representing corresponding selectable managed entities associated with the storage area network, at least one of the selectable managed entities representing a virtual network topology that may be selected for viewing in a second region of the display screen;
    - 15       in the second region of the display screen:
      - displaying a physical network topology associated with the storage area network, the physical network topology including at least one switch resource that supports connectivity among host resources and storage resources in the storage area network; and
      - 20       displaying the virtual storage area network topology based on a selection of at least one of the multiple icons, the virtual storage area network i) being overlayed on the physical network topology, and ii) including identified ports of the at least one switch resource that are associated with a corresponding virtual storage area network.
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43. A computer system as in claim 42, wherein displaying the virtual network topology includes:

simultaneously displaying i) a first virtual storage area network associated with a first selected managed entity, and ii) a second virtual storage area network associated with a second selected managed entity; and

5 the first virtual storage area network and the second storage area network being illustrated as portions of the physical network topology displayed on the display screen.

44. A computer system as in claim 43, wherein displaying the virtual network topology includes:

10 highlighting portions of the physical network topology to identify at least partial paths between host resources and storage resources associated with the first virtual storage area network and the second storage area network.

45. A computer system as in claim 42 further comprising:

15 displaying the first region on the left side of the display screen, the first region including a vertically disposed hierarchy of multiple icons representing corresponding selectable and expandable managed entities associated with the storage area network;

20 displaying the virtual network topology and physical network topology on a left side of the display screen, the virtual network topology including specific ports and corresponding identification information of the specific ports of the at least one switch resource associated with the virtual storage area network topology; and

25 highlighting the specific ports of the at least one switch resource to indicate that the specific ports are part of the virtual storage area network topology.

46. A computer system as in claim 42 further supporting operations of:

30 displaying at least one host resource and at least one storage resource associated with the virtual storage area network topology on the display screen.

47. A computer system as in claim 46 further supporting operations of:

  - in the second region of the display screen, highlighting connection paths between the at least one host resource and the at least one switch resource as well as between the at least one switch resource and the at least one storage resource;
  - displaying an identification of host resource ports associated with the at least one host resource that physically couple to corresponding switch resource ports of the at least one switch resource; and
  - displaying an identification of storage resource ports of the at least one storage resource that physically couple to corresponding switch resource ports of the at least one switch resource.

48. A computer program product including a computer-readable medium having instructions stored thereon for processing data information, such that the instructions, when carried out by a processing device, enable the processing device to perform the steps of:

  - displaying a physical network topology associated with the storage area network on a display screen, the physical network topology including identification of at least one switch resource that supports connectivity among resources in the storage area network;
  - receiving input from a user to display at least one virtual network associated with the storage area network; and
  - displaying a virtual network topology associated with the at least one virtual network in relation to the physical network topology on the display screen.

49. A computer system associated with a storage area network, the computer system providing:

  - means for displaying a physical network topology associated with the storage area network on a display screen, the physical network topology including

identification of at least one switch resource that supports connectivity among resources in the storage area network;

means for receiving input from a user to display at least one virtual network associated with the storage area network; and

5 means for displaying a virtual network topology associated with the at least one virtual network in relation to the physical network topology on the display screen.